

## **Environmental impact of human activities on Delingha Basin: Implications from heavy metal elements in the sediments of Lake Toson, NW China**

AIYING CHENG<sup>1,2</sup>, JUNQING YU<sup>1,2</sup>, CHUNLIANG GAO<sup>1,2</sup>,  
LISHA ZHANG<sup>1,2</sup>

<sup>1</sup> Key Laboratory of Comprehensive and Highly Efficient Utilization of Salt Lake Resources, Qinghai Institute of Salt Lakes, Chinese Academy of Sciences, Xining 810008, China

<sup>2</sup> Qinghai Provincial Key Laboratory of Geology and Environment of Salt Lakes, Qinghai Institute of Salt Lakes, Chinese Academy of Sciences, Xining 810008, China

Lake sediments are useful environmental archives for examining natural environmental changes and for detecting possible anthropogenic contamination history in catchment areas. As the environmental impact of human activities on the Delingha basin became more and more significant, sediment cores were recovered, for the first time, from the central area of Toson lake in Delingha Basin, northeastern Tibet Plateau. Heavy metal elements Cd, Cr, Cu, Zn and Pb in sediments are determined quantitatively with ICP-AES measurements and qualitatively by XRF core scanning method. The effect of water content in the sediments was calibrated for the multiple elemental data measured by the XRF core scanner. The elemental data analyzed using the two methods show positive correlation with fairly high correlation coefficients  $r = 0.673 \sim 0.925$ . The multiple elemental contents from the XRF scanning of sediment cores show increased precision, and accuracy following the calibration. The measured Cd and Zn concentrations in the sediments show relatively higher values than their background values of the region. The evaluation based on the measured Cr, Cu, Zn, Pb concentrations in the sediments of Toson Lake suggests that Toson Lake has been slightly polluted due to the human activities in Delingha Basin. Attention must be paid to the Cd concentration, which implies a moderate contamination of the lake as a result of industrial activity in the Delingha area. This study is financially supported by the NSFC grant Nos. 41401059, 41471013, U1407206.